

Exhibit 4

Our Ref.:
041003.P021

APPLICATION FOR UNITED STATES LETTERS PATENTS

FOR

TIME SLOT BASED CALENDAR WITH USER TYPES AND
ASSOCIATED ACCESS PRIVILEGES

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"Express Mail" label number _____

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to computer hosted calendars, more particularly the present invention relates to computer hosted calendars having a plurality of distinct read and write authorizations at time slot granularity of a calendar.

2. Background Information

Computer hosted calendaring systems in general are well known in the art. These prior art systems provide to an individual user a computer maintained record of the individual user's event schedule, and data associated with each event in the schedule, arranged for viewing in a temporal presentation. Each event usually has three components, a starting time, an ending time, and a description, with the starting time and the ending time together defining an event time-slot. The temporal presentation is generally arranged according to a calendar. The calendar is generally arranged according to several selectable views that include a yearly view, a monthly view, a weekly view, a two-day view, and a daily view.

Computer hosted calendaring systems are generally maintained and/or stored either in a stand-alone computer system, or in a networked computer system. In a networked computer system, the calendaring system can also be networked. A networked calendaring system permits a calendar owner's calendar, whose event schedule is maintained and/or stored by one computer system, to be accessed on another computer system functionally connected to the computer system that maintains and/or stores the calendar owner's

calendar. In these networked calendaring systems, a calendar owner's system is generally maintained and stored on a server system, with the calendar owner, and other potential user's of the calendar, functioning as clients in relation to the server. Alternatively, the calendar owner's calendar may be maintained and stored in the calendar owner's computer, with other users functionally connected to the calendar owner's calendar through a server, or alternatively interfacing directly to the calendar owner's calendar in a local network having local protocols.

A computer hosted calendaring system is conventionally accessible by authorized users other than the calendar owner, who can read and/or write event data from and to the calendar owner's schedule. However, these prior art calendaring systems provide to these authorized users an authorization for only the entire calendar owner's calendar (except for conventionally designated private events), rather than for uniquely defined time-slots for a read and/or a write operation. Moreover, these prior art systems do not provide for a plurality of user groups, each user group defined by a set of distinct authorized time-slots for a read and/or a write operation.

SUMMARY OF THE INVENTION

A method of calendaring events in a computing system, and an article containing instructions for operating a calendar in a computing system are disclosed. A calendar owner may define a plurality of groups and/or user types and user identifications for his or her calendar to the computing system. For each group affiliation, user type or user identification, the calendar owner designates the time-slots in his or her calendar to which the user, or a user

affiliated with a group or having a user type or identification has both may
have a time slot based read access, and/or a time slot based write access, to
his or her calendar. The time slot based read access and the time slot based
write access time-slots may be separately defined. The calendar owner
5 can also assign individual parties to the designated access of another user
type or identification.

A party trying to gain read and/or write access to the calendar owner's
calendar attempts to access the calendar through the computer. If the party
has been designated by the calendar owner to have access to at least some
10 of time slots of the calendar owner's calendar, he or she is accorded the time-
slots that the calendar owner has designated.

In one embodiment of the present invention, the computer system
designates to each possible second party user a time slot based read and/or
a write access privilege, each including an ability to read or write data from at
15 least one particular predetermined calendar a subset of time slots, but not all
the time slots. The computer reads an identification of a party conforming to
one of the possible users, and the user is granted accesses to data of
selected calendar time slots data according to the user's designated time slot
based calendar access privilege.

20 In another embodiment of the present invention, one or more
computer-readable media have stored a plurality of programming instructions
for execution by at least one computer, that when executed perform the
operation of designating to a user of the calendar a specific time slot based
access ability ability, explicitly granted, or implicitly granted based on a

characteristic of the user, and processing a request to access selected time slots of the calendar based on the designated time slot based access ability.

BRIEF DESCRIPTION OF THE DRAWINGS

- 5 The present invention will be described by way of exemplary embodiments, but not limitations, illustrated in the accompanying drawings. Identical numerals indicate the same elements throughout the figures.

Figure 1 is an exemplary Owner Authorization menu presented to a calendar user on a computer system display, according to one embodiment.

- 10 A calendar owner uses an Owner Authorization menu to grant to a second party read and/or write access to the owner's calendar, as well as to designate the time-periods for the respective second party read and/or write access.

- 15 Figure 2 is an exemplary Guest Identification menu for associating a user group with a user identification according to one embodiment.

Figure 3 is the exemplary Owner Authorization menu of Figure 1 in which both read and write access data has been entered for a second party user, as well as the time-periods for that access.

- 20 Figure 4 is an exemplary conventional monthly calendar with entries, presented on a computer system display or alternatively printed.

Figure 5 is an exemplary conventional two-day calendar for the days Thursday June 8, and Friday June 9, presented on a computer system display or alternatively printed.

Figure 6 is an exemplary monthly calendar extracted from the calendar owner's monthly calendar portrayed in Figure 4, for a second party user having an exemplary restricted read access portrayed as the time-periods entered in the Owner Authorization menu portrayed in Figure 3, presented on a computer system display or alternatively printed, according to one embodiment.

Figure 7 is an exemplary conventional two-day calendar with entries that are consistent with the entries portrayed in Figure 4 for an exemplary date June 12, presented on a computer system display or alternatively printed.

Figure 8 is an exemplary conventional two-day calendar with entries that are consistent with the entries portrayed in Figure 4 for an exemplary date June 13, presented on a computer system display or alternatively printed.

Figure 9 is an exemplary conventional two-day calendar with entries that are consistent with the entries portrayed in Figure 4 for an exemplary date June 15, presented on a computer system display or alternatively printed.

Figure 10 is an exemplary two-day calendar from a calendar owner's two-day calendar for June 12 portrayed in Figure 7 according to one embodiment, for a second party user having a restricted read access portrayed as the time-periods entered in the Owner Authorization menu portrayed in Figure 3, presented on a computer system display or alternatively printed.

Figure 11 is an exemplary two-day calendar from a calendar owner's two-day calendar for June 13 portrayed in Figure 7 according to one embodiment, for a second party user having a restricted read access portrayed as the time-periods entered in the Owner Authorization menu portrayed in Figure 3, presented on a computer system display or alternatively
5 printed.

Figure 12 is an exemplary two-day calendar from a calendar owner's two-day calendar for June 15 portrayed in Figure 8 according to one embodiment, for a second party user having a restricted read access
10 portrayed as the time-periods entered in the owner authorization menu portrayed in Figure 3, presented on a computer system display or alternatively printed.

Figure 13 is an exemplary Guest menu for a second party to access a calendar owner's calendar, to read from and/or write to the calendar owner's
15 calendar, according to one embodiment.

Figure 14 is an exemplary Second Party Write menu for a second party to write into a calendar owner's calendar, according to one embodiment.

Figure 15 is a flowchart portraying a method according to one embodiment, of maintaining a second party read access status, and a second
20 party write access status.

Figure 16 is a flow chart for associating a user identification or access type with a calendar access ability, and designating to a calendar user that access ability, according to one embodiment.

Figure 17 is a flowchart for reading and writing data from a time-slot of a computer maintained calendar of this invention, according to one embodiment.

Figure 18 is a flowchart for receiving from a second party having a user type or group affiliation, a request for a first party's calendar for a time-period, and processing the request according to the user type or group affiliation, according to one embodiment.

Figure 19 is a flowchart for receiving input for a calendar owner's calendar by a second party user, and processing the input according to the second party's type or affiliation, according to one embodiment.

Figure 20 is an exemplary computer system that is related to the use of the present invention, according to an embodiment.

DETAILED DESCRIPTION OF THE INVENTION

In the following description, various aspects of the present invention will be described. However, it will be apparent to those skilled in the art that the present invention may be practiced with only some or all aspects of the present invention. For purposes of explanation, specific numbers, materials and configurations are set forth in order to provide a thorough understanding of the present invention. However, it will also be apparent to one skilled in the art that the present invention may be practiced without the specific details. In other instances, well known features are omitted or simplified in order not to obscure the present invention. In particular, the present invention is presented with reference to a plurality of displays and data input menus.

These displays and data input menus are exemplary and illustrative of an embodiment of the present invention, and how the present invention can be used. It is understood that the displays and menus required by the present invention and presented herein for exemplary purposes are adaptable to conform to the data display and entry characteristics of other calendaring systems.

Some portions of the detailed descriptions that follow are presented in terms of algorithms and symbolic representations of operations on data bits within a computer memory. These algorithmic descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. An algorithm is here, and generally, conceived to be a self-consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, or the like.

It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise as is apparent from the following discussion, it is appreciated that throughout the description, discussions utilizing terms such as "processing" or "computing" or "calculating" or "determining" or "displaying" or the like, refer

to the action and processes of a computer system, or similar electronic computing device, that manipulates and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within
5 the computer system memories or registers or other such information storage, transmission or display devices.

The present invention also relates to apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, or it may include a general purpose computer selectively
10 activated or reconfigured by a computer program stored in the computer. Such a computer program may be stored in a computer readable storage medium, such as, but is not limited to, any type of disk including floppy disks, optical disks, CD-ROMs, and magnetic-optical disks, read-only memories (ROMs), random access memories (RAMs), EPROMs, EEPROMs, magnetic
15 or optical cards, or any type of media suitable for storing electronic instructions, and each coupled to a computer system bus.

The algorithms and displays presented herein are not inherently related to any particular computer or other apparatus. Various general purpose systems may be used with programs in accordance with the
20 teachings herein, or it may prove convenient to construct more specialized apparatus to perform the required method steps. The required structure for a variety of these systems will appear from the description below. In addition, the present invention is not described with reference to any particular programming language. It will be appreciated that a variety of programming

languages may be used to implement the teachings of the invention as described herein.

~~Parts of the description will be presented using terms such as scripts, applet, end-user interfaces, icons, and so forth, commonly employed by those skilled in the art to convey the substance of their work to others skilled in the art. Parts of the description will be presented in terms of operations performed by a computer system, using terms such as registering, notifying, sending, and so forth. As well understood by those skilled in the art, these quantities and operations take the form of electrical, magnetic, or optical signals capable of being stored, transferred, combined, and otherwise manipulated through mechanical and electrical components of a digital system; and the term digital system include general purpose as well as special purpose data processing machines, systems, and the like, that are standalone, adjunct or embedded.~~

Various operations will be described as multiple discrete steps performed in turn in a manner that is most helpful in understanding the present invention, however, the order of description should not be construed as to imply that these operations are necessarily order dependent, in particular, the order the steps are presented. Furthermore, the phrase "in one embodiment" will be used repeatedly, however the phrase does not necessarily refer to the same embodiment, although it may.

Referring now to Figure 1, a calendar owner (or other party having access authority for the calendar, hereinafter calendar owner) can preferably call up an Owner Authorization menu 101 on a computer display to give use access to a party, a group of parties, or a type of user to the owner's

calendar. The Owner Authorization menu 101 has a User data entry field 102 for an alphanumeric selection of the party, group of parties, or type of user (hereafter second party) being given an access status to the user's calendar.

The user preferably selects the User data entry field 102, and subsequently enters the second party's alphanumeric designation via a computer keyboard, with the entry subsequently displayed in the User data entry field 102.

The Owner Authorization menu 101 has a selection field for designation of a read access status 104a, and a selection field for designation of a write access status 104b. The default access status for any second party is not-access, but whatever access status that was previously selected for a second party, it is preferably maintained until the authorized access is changed. In order to give read access to the second party, the owner selects the read access selection field 104a, and in order to not give read access to the second party, the owner does not select the read access selection field 104a. Similarly, in order to give write access to the second party, the owner selects the write access selection field 104b, and in order to not give write access to the second party, the owner does not select the write access field 104b. The calendar owner selects both the read access selection field 104a and the write access selection field 104b, in order to give both a read and a write access to the second party, and the calendar owner does not select the read access field 104a and the write access field 104b, in order to not give both a read and a write access to the second party.

The Owner Authorization menu 101 has selection fields for designation of the time-periods within the calendar owner's calendar for which the second

party is being given read access 106a and write access 106b. The read access and write access selection fields 106a and 106b, are preferably implemented as a separate selection field for each day of the week 106a1, 106b1 for recurrent access throughout the year, and alternatively as a day of a month 106a2, 106b2 for a specific date in a year; as well as a time-period 106a3, 106b3 implemented from a first designated hour and minute, to a second designated hour and minute, for read access and write access respectively.

The Owner Authorization menu 101 also has selection fields for event types 103, including exemplary event types meeting, appointment, reminder, and event. The calendar owner can optionally select these event types in an embodiment of the present invention, to further restrict second party access to the writing of specific event types, or the reading of specific event types within the valid access time-periods.

Referring now to Figure 2, a Guest Identification menu 108 embodiment of the present invention enables the association of the access granted to a second party user identified in User data entry field 102 with a particular second party user entry, so that a calendar owner can define the access status of a party, a group of parties, or a type of user in the exemplary Owner Authorization menu 101, and give the particular second party that same defined calendar access. This capability of the present invention allows the calendar owner to give an access status to a grouping, and then assign to an individual or other group title the access status of the grouping. This enables the particular second party to access the calendar owner's calendar

by entry of the particular second party alphanumeric identification, rather than the second party user identification entered in User data entry field 102.

The calendar owner preferably selects Group/Type data entry field 109b and subsequently enters the party, group of parties, or type of user entered in User data entry field 102 of Figure 1 in the Group/Type entry field 109b, and selects User data entry field 109a and subsequently enters the particular party alphanumeric identification in User data entry field 109a, preferably in any order. The particular party acquires the same calendar access status as the party, group of parties, or type of party entered in data entry field 109b. In the preferred embodiment of the present invention, only a calendar owner may enter data into this menu. In another embodiment of the present invention, any party may enter data into this menu, and if the calendar owner desires to maintain an access control of his or her calendar, he or she will enter a cryptic ID entry in data entry field 102. A specific example of the utility of this aspect of the present invention is a calendar owner assigning an access status to "teachers" in data entry field 102, entering in Type data entry field 109b "teachers", and the name of a particular second party such as the name "Ann" in User data entry field 109a, and accordingly giving the access status of "teachers" to "Ann", who may be a particular teacher.

Referring now to Figure 3, a calendar owner has entered data into the Owner Authorization menu 101 described with reference to Figure 1. In this exemplary Owner Authorization menu data entry, a calendar owner has granted both a read access and a write access to a second party identified in

data entry field 102 as an exemplary Mr. Charney, for Mondays-Fridays, from 9:00 a.m. – 3:00 p.m. each day. This is an example illustrative of the utility and novelty of the present invention, wherein a calendar owner may can grant both, or either, a read and write access to a second party for a specific time-
5 period. In the example portrayed, the entries are consistent with a student calendar owner granting both a read access and a write access for his or her calendar to a teacher, during, and only during, the traditional time-slot of the traditional school day. Other useful second parties are, for instance, social friends having calendar access on Friday and Saturday nights, study group
10 members having calendar access on weekday nights, and teachers having calendar access Mondays-Fridays, 9:00 a.m.-3:00 p.m..

In User data entry field 102, the calendar owner has entered a "Mr. Charney" as the identification of the second party to have access to the user's calendar. The calendar owner has designated in read access field 104a, a
15 read access, and in write access field 104b, a write access, to Mr. Charney. In the read access day of the week selection field 106a1, the calendar owner has selected both Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays, thus giving to Mr. Charney a read access to the calendar owner's calendar for each day Monday-Friday. In the read access time-period
20 selection field 106a3, the calendar owner has given to Mr. Charney, for each of the read access designated days Mondays-Fridays, a time-slot read access for from 9:00 a.m. to 3:00 p.m.. In the write access day of the week selection field 106b1, the calendar owner has selected both Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays, thus giving to Mr. Charney a write

access to the calendar owner's calendar for each day Monday-Friday. In the write access time-period selection field 106b3, the calendar owner has given to Mr. Charney, for each of the write access designated days Mondays-Fridays, a time-slot write access for from 9:00 a.m. to 3:00 p.m..

- 5 Thus, the calendar owner, by entering data into the exemplary Owner Authorization menu 101, has given to a user having an identification of "Mr. Charney" both a read access to his/her calendar for each day Monday - Friday, from 9:00 a.m. - 3:00 p.m., and a write access for each day Monday - Friday, from 9:00 a.m. - 3:00 p.m.. This example is useful for the case in
- 10 which the calendar is owned by a student, and Mr. Charney is a teacher, or vice versa. According to the exemplary calendar access inputs, a student has given one of his/her teachers both a read and a write access to the student's calendar during normal school hours, Mondays - Fridays, 9:00 a.m. - 3:00 p.m.. The teacher Mr. Charney can both write to the owner's calendar for
- 15 these time-slots, as well as read from the owner's calendar for these time-slots.

Referring now to Figure 4, a conventional exemplary monthly calendar 115 displays a calendar owner's time-period entries for each day of an exemplary month. The calendar displays for each day, the beginning time for

20 each time-slot entry. It is noted that calendar 115 indicates time entries for each day Thursday June 1, through Saturday June 17, as well as Wednesday June 21, Thursday June 22, and Thursday June 29. With specific exemplary reference to Thursday June 1, the calendar 115 indicates two time-slot entries, the first at 12:00 p.m., and the second at 6:00 p.m., and with specific

exemplary reference to Friday June 9, the calendar 115 indicates one time-slot entry beginning at 1:00 p.m..

Referring to Figure 5, a conventional exemplary two-day calendar 117 for Thursday June 8, and Friday June 9, corresponds to the entries in the monthly calendar 115 portrayed with reference to Figure 4. The two-day calendar 117 displays that the Friday June 9, time-slot entry portrayed in monthly calendar 115 is for a time beginning at 1:00 p.m. and ending at 4:00 p.m..

Referring to Figure 6, a preferred embodiment second party read access monthly calendar 135 of the present invention that corresponds to the calendar owner's calendar 115 is illustrated seen for a second party having a read access for the calendar owner's calendar 115 only for the time-slots Mondays – Fridays, 9:00 a.m. – 3:00 p.m.. The exemplary read access time-slots are consistent with the entries portrayed on the Owner Authorization menu 101 with reference to Figure 3. In calendar 135, the only data displayed from calendar owner's calendar 115 is the data for time-slots Mondays – Fridays, 9:00 a.m. – 3:00 p.m., corresponding to the exemplary second party's read access times. Thus, with reference to both Figures 3 and 5, the entries for Mondays - Fridays, 3:00 p.m. – 9:00 a.m., and all day Saturdays and Sundays, have been omitted from the calendar owner's calendar 115 for presentation of the calendar for a reader having a restricted read access as in the example herein. Referring to Figure 4, the entries 110a-g fall fully within the time-slots Mondays – Fridays, 9:00 a.m. – 3:00 p.m., and are displayed in the restricted read access calendar 135 portrayed

in Figure 6. The entries 120a-e, for all Saturdays and Sundays, are not within the time-slots Mondays – Fridays, 9:00 a.m. – 3:00 p.m., and are not displayed in the restricted read access calendar 135 portrayed in Figure 6. The entries 130a-e, for time entries fully outside the read access period of 9:00 a.m. – 3:00 p.m. for Mondays – Fridays, are not displayed in the restricted read access calendar 135 portrayed in Figure 6.

The time-slot entries that fall only partially within the second party read access time-slots are preferably portrayed in the second party's calendar with the time-slots falling within the valid second party read access time-slots displayed (or printed for a printed calendar), but without the descriptive information otherwise associated with a time-slot entry, and the time-slots falling outside of without the valid second party read access time-slots not displayed (or printed).

Thus, referring to Figure 4, time-slot entries 140a-c are portrayed on the conventional calendar owner's monthly calendar as beginning at 1:00 p.m. on June 12, with descriptive data printed; as beginning at 8:00 a.m. on June 13, with descriptive data printed; and beginning at 7:00 a.m. on June 15, with no descriptive data printed; for entries 140a, 140b, and 140c respectively.

Referring to Figure 7, the conventional calendar owner's two-day calendar for June 12, portrays the entry 140a beginning at 1:00 p.m. in the monthly calendar, as spanning the time-period 1:00 p.m. – 5:00 p.m. and having an exemplary descriptive data "DOCTOR" 160a.

Referring to Figure 8, the conventional calendar owner's two-day calendar for June 13, portrays the entry 140b beginning at 8:00 a.m., as spanning the time-period 8:00 a.m. – 10 a.m. and having an exemplary descriptive data "MEETING" 160b.

- 5 Referring to Figure 9, the conventional calendar owner's two-day calendar for June 15, portrays the entry 140c beginning at 7:00 a.m., as spanning the time-period 7:00 a.m. – 10:00 a.m. 160c.

- Again referring to Figure 6, the second party's preferred embodiment exemplary monthly calendar for June 12 portrays the entry 140a as time entry
10 1550a beginning at 1:00 p.m. and having no descriptive data printed. For June 13, ~~portrays the entry 140b~~ is portrayed as time entry 1550b beginning at 9:00 a.m., rather than 8:00 a.m., and having no descriptive data printed. For June 15, ~~portrays the entry 140c~~ is portrayed as time entry 1550c beginning at 9:00 a.m. and having no descriptive data printed.

- 15 Referring to Figure 10, the second party's preferred embodiment exemplary two-day calendar for June 12 portrays the Figure 7 time entry 160a, spanning the time range 1:00 p.m. – 5:00 p.m. and having an associated exemplary descriptive data "~~Doctor's office~~", as a time entry 170a spanning the time range 1:00 p.m. – 3:00 p.m., so as to be fully within the
20 bounds of the second party's valid read access times 9:00 a.m. – 3:00 p.m., and having no associated descriptive data.

Referring to Figure 11, the second party's preferred embodiment exemplary two-day calendar for June 13 portrays the Figure 8 time entry 160b, spanning the time range 8:00 a.m. – 10:00 a.m. and not having an

associated exemplary descriptive data "MEETING", as a time entry 170b spanning the time range 9:00 a.m. – 10:00 a.m., so as to be fully within the bounds of the second party's valid read access times, and having no associated descriptive data.

- 5 Referring to Figure 12, the second party's preferred embodiment exemplary two-day calendar for June 15 portrays the Figure 9 time entry 160c, spanning the time range 7:00 a.m. – 10:00 a.m. and having no associated descriptive data, as a time entry 170c spanning the time range 9:00 a.m. – 10:00 a.m., so as to be fully within the bounds of the second
- 10 party's valid read access times, and having no associated descriptive data.

- Referring to Figure 13, a second party user gains both read and/or write access to the calendar owner's calendar by preferably entering appropriate data into a second party Guest Access menu 180. The second party selects and enters in the Open Calendar data entry field 182 an
- 15 identifier of the calendar he or she is attempting to access. This identifier may be an identifier of the calendar owner. In a non-networked embodiment of the present invention, the non-networked computer may maintain a unitary calendar, and the User Authorization menu of an embodiment of the present invention may not have an open calendar data entry field for an identifier of
- 20 the calendar, because there is only one calendar. The second party also preferably selects and subsequently enters into the User ID data field 184, his or her alphanumeric identifier. The alphanumeric identifier is the party, group of parties, or type of user identifier entered in exemplary data entry field 102 of Figure 1, and alternatively in an embodiment of the present invention the

particular person identifier entered in exemplary data entry field 109ab in Figure 102 that corresponds to the access status granted a second party in data entry field 102.

It is expected that the second party identifier will generally be a group user type or group affiliation, e.g. "staff member", "teachers(s)", or some other coded group identifier, and that other members of the group user type or affiliation will enter that same group identifier in data entry field 184, to gain the access status designated by the calendar owner. Thus, in an example, the calendar owner will grant second party calendar access to "staff member", and in order for a staff member to access the calendar according to his or her designated status, will enter in ID data entry field 184 "staff member". However, if the calendar owner has entered a particular party identifier in exemplary data entry field 109ab, a second party may also enter that particular identifier in exemplary ID data entry field 184 to gain access to the calendar. This is useful when the calendar owner wants to grant an access to particular persons on an individual basis and does not publish the party user identification entered into the User data entry field 102.

It is understood that networked embodiments of the present invention may not have a data field to enter the second party user's identification, because the second party's computer system, the server, or the computer that maintains the calendar, may already have acquired the second party user's identification. The calendar support software verifies the second party user's identification and, if the identification is in the second party records, sends to the second party computer system the calendar owner's calendar

commensurate with the second party's read access status, and grants write access to the second party commensurate with the second party's write access status.

Referring to Figure 14, the exemplary Second Party Write menu 190 includes the data fields appropriate for a second party event schedule record creation, edit, and deletion. It is specifically contemplated that this data may include the prior-art-event date 192, beginning and ending time 194, brief description 196, event type 198 including an exemplary appointment 198a, meeting 198b, event 198c, and reminder 198d, and detailed description 1200. If the second party requesting access to the calendar owner's calendar does not have a read access and/or a write access status, the support software of the present invention displays to the second party a corresponding notification.

Referring to Figure 15, the calendar processing software of the present invention maintains a calendar access status for second parties with respect to the calendar owner's calendar. Thus, a second party having a read access and/or a write access status with respect to the calendar has that status, and the assigned time-periods to which access has been granted, maintained by the software. The preferred embodiment of the present invention uses the Owner Authorization menu 101, portrayed with reference to Figure 1, to create and/or update the read access and/or write access status for second parties.

According to the design of the Owner/User Authorization menu 101, the calendar processing software determines the alphanumeric identification

of a second party 4200, as entered in the preferred embodiment by the calendar owner in the user data entry field 102, and The calendar support software determines whether that identified second party has a read access status in memory for the calendar owner's calendar 4202. If the second party
5 has a read access status record in memory, and the read access status field 104a associated with the second party is not selected 4204, the support software eliminates the read access status for the second party from memory 4208. If the second party has a read access status in memory, and the read access status field 104a associated with the second party is selected, the
10 support software updates the read access status record associated with the second party in memory with the time-slot information from the read access time-period information 106a, 4206. If the second party does not have a read access status in memory, and the read access status field 104a associated with the second party is selected, the support software creates a read access
15 status record in memory for the second party and associates with that record the time-slot information from the read access time-period information 106a, 4210.

The calendar support software determines if the identified second party has a write access status in memory for the calendar owner's calendar 4212.
20 If the second party has a write access status record in memory, and the write access status field 104b associated with the second party is not selected, the support software eliminates the write access status for the second party from memory 4216. If the second party has a write access status in memory, and the write access status field 104b associated with the second party is

selected, the support software updates the write access status record associated with the second party in memory with the time-slot information from the write access time-period information 106b, 4218. If the second party does not have a write access status in memory, and the write access status field 104b associated with the second party is selected, the support software creates a write access status record in memory for the second party and associates with that record the time-slot information from the write access time-period information 106b, 4220.

If the present invention embodiment includes an Owner Authorization menu having data entry fields for a selection of a read and/or write access status and non-access status, the support software determines the access status directly from the data entry fields, and creates and maintains the second party access status according to the status of these fields.

In the preferred embodiment of the present invention, the calendar support software only creates a second party calendar having data for the read access time-slot information associated with the second party when a second party makes a read request of the calendar support software. When a second party makes a read request to the calendar owner's calendar, the support software first determines whether the second party has a read access status, and if so sends the calendar data for the read access data time-slots requested by the second party that match the second party's read access times stored in the second party's read access record. It is specifically contemplated that the present invention includes both the creation and maintenance of a calendar for each second party having read access at all times, and/or the sending of calendar information to a second party for the

times in which the second party has read access to the calendar owner's calendar whenever updates are made to the valid second party read access times. In the preferred embodiment of the present invention, the calendar support software writes data into the calendar owner's calendar from a
5 second party for, and only for, the time-slots that correspond to the second party's valid write access time-periods.

Referring to Figure 16, the preferred embodiment calendar processing software of the present invention includes instructions that designate to a calendar user a specific access ability based on a characteristic of the
10 calendar user 4244. The calendar user preferably enters into the computer by a menu his/her alphanumeric identification, preferably using the Guest menu described with reference to Figure 13. The calendar processing software processes the request to access the calendar based on the access ability that was designated to that user 4246.

15 According to a preferred embodiment of the present invention, the designating 4244 is based on associating with each user characteristic an access ability to the calendar that includes an ability to read data from specific time-periods, and/or write data into specific time periods, where the designated access ability includes the access ability that is associated with a
20 conforming user characteristic. This user characteristic conforms in the recommended usage of this invention to the name of a user given calendar access, or a group affiliation or user type of that user, described as an alphanumeric selection of a party, group of parties, or type of user with reference to Figure 1. According to the preferred embodiment of the present

invention, the preferred mode for entering this information is the Owner Authorization menu **101** described with reference to Figure 1. Each user writes calendar data into the calendar from the user for the time-periods that the user has a write access ability **4246**, and reads calendar data to the user for the time-periods that the user has a read access ability **4248**.

The processing **4246** includes, if the designated specific access ability includes an ability to write into the calendar for specific write-data time-periods, writing user data inputs into the calendar for the write-data time-periods, and, if the designated specific access ability includes an ability to read data from the calendar for specific read-data time-periods, outputting to the user a request to read data from the calendar for the read-data time-periods.

Referring to Figure 17, the present invention includes a method of reading data from at least one time-slot, and writing data into at least one time-slot of a computer system maintained calendar. The method includes the computer system designating **4250** to a non-calendar owner user particularized by his/her identification, a calendar access privilege, including a read access privilege and/or a write access privilege. The read access privilege includes an ability to read data from a first set of time-slot entries. The write access privilege includes an ability to write data to a second set of time-slots, wherein the first set time-slot entries and the second set time-slot entries are independent and may or may not fully or partially coincide. The method also includes the computer system reading an identification that is the identification of the user or one that has an access privilege of the user **4252**,

and the user accessing calendar data from the computer system in accordance with the privilege 4254. The method includes reading data from the calendar and/or writing data to the calendar, based on the access privilege. The reading data includes reading data from only the first set of time-slot entries, and the writing data includes writing data to only the second set of time-slot entries.

Referring to Figure 18, the present invention includes a method of receiving a request for a first party's calendar by a second party for a time-period, the second party having at least a selected group affiliation or a selected user type 4274. The method includes selectively providing calendar entries for the first party's calendar for the time-period in accordance with the second party's selected group affiliation 4276 or user type 4278, in response to the received request.

Referring to Figure 19, the present invention includes a computer implemented calendaring method that includes receiving input for a first party's calendar for a time-period by a second party that has a selected group affiliation/user type 4282, and processing the received request in accordance with the second party's group affiliation/user type 4284.

Referring to Figure 20, computer system 2300 comprises bus 2301, or other communication device for communicating information, and processor(s) 2302 coupled with bus 2301 for processing information. Computing system 2300 further comprises main memory 2304, a computer readable media that is commonly random access memory (RAM) or other dynamic storage device, coupled to bus 2301 for storing information and instructions for execution by

processor 2302. Main memory 2304 can also be used to storing temporary variables or other intermediate information during execution of instructions by processor 2302. Computer system 2300 also comprises a read only memory (ROM) media and/or other static storage device 2306 coupled to bus 2301 for storing static information and instructions for processor(s) 2302. Data storage device 2306, another computer readable media, is coupled to bus 2301 for storing information and instructions, and can be such exemplary computer readable media as magnetic disk, and/or an optical disk and corresponding drives. Display 2308 is coupled to bus 2301 for displaying data generated by the processors 2302, and mouse 2310, or other exemplary selecting or pointing device, and keyboard 2312, each coupled to bus 2301, are used to input data into the processor 2302.

While certain exemplary embodiments have been described and shown in the accompanying drawings, it is to be understood that these embodiments are merely illustrative of and not restrictive of the broad invention. For example, the present invention is presented with reference to a plurality of displays and data input menus. These displays and data input menus are exemplary and illustrative of an embodiment of the present invention, and how the present invention can be used. It is understood that the displays and menus required by the present invention and presented herein for exemplary purposes are adaptable to conform to the data display and entry characteristics of other calendaring systems. The present invention is not limited to the specific constructions and arrangements shown and described, and alternative embodiments will become apparent to those skilled

in the art to which the present invention pertains without departing from the scope of the present invention. The scope of the present invention is defined by the appended claims rather than the foregoing description.

I claim:

- 1 1. A computer implemented calendaring method comprising:
2 receiving inputs for a first party's calendar for a time-period, with the
3 inputs being submitted by a second party ~~having at least a selected an~~
4 identification identifiable to be characterized by at least one of a group
5 affiliation and a user type;
6 processing said received input in accordance with the second party's at
7 least one of group affiliation ~~and~~ user type characterizable identification.
- 1 2. The method defined in claim 1 including defining before said receiving
2 at least one identification and an associated access privilege to said calendar,
3 with each of said at least one pre-defined identification being characterizable
4 by at least one of group affiliation an user type; and wherein said selected
5 identification of said second party corresponds to one of said at least one pre-
6 defined identifications, and said processing includes granting said second
7 party an access ability to said calendar associated with said selected
8 identification of said second party.
- 1 3. The method defined in claim 1 including receiving inputs by said first
2 party of at least one identification and an associated calendar access
3 privilege, with each of said at least one identification being characterizable by
4 at least one of group affiliation and user type, and each of said at least one
5 associated calendar access privileges ~~each~~ including at least one of an
6 second-party ability to access read data of said calendar-data for only

7 specified calendar time-slots, and to write data into said calendar for only
8 specified time-slots; and wherein said-received identification offfrom said
9 second party corresponds to one of said at least onereceived identifications
10 inputted byfrom said first party, and said processing includes granting said
11 second party the associated calendar access privilegeability associated with
12 said corresponding received-identification.

1 4. A computer implemented calendaring method comprising:
2 receiving a request for a first party's calendar for a time-period,
3 wherein the request is being submitted by a second party having anselected
4 identifier identifiable to be characterized by at leastincluding one of a group
5 affiliation-identifier and a user type-identifier;
6 selectively providing calendar entries for the first party's calendar for
7 the time-period in accordance with the second party's at least one of group
8 affiliation and user type characterized identifier in response to said request.

1 5. The method defined in claim 4 further including defining at least one
2 identifier before said receiving, with each of said at least one pre-defined
3 identifier being characterizable by at least one of group affiliation and user
4 type, wherein said selected identifier of said second party is one of said at
5 least one pre-defined input identifiers.

1 6. The method defined in claim 4 further including before said request by
2 said second party, receiving input from said first party that defines at least
3 one identifier, with each of said at least one pre-defined identifier being

characterizable by at least one of group affiliation and user type; and wherein said selected identifier of said second party is one of said at least one identifiers received from said first party.

7. The method defined in claim 4 further including defining at least one identifier before said receiving, including defining at least one time-period associated with each said pre-defined identifier, with each time-period being a time-period where a party having the corresponding pre-defined identifier is authorized for one of writing an entry for said calendar-entry and for viewing an entry in said calendar.

8. A method of reading data from at least one time-slot and writing data into at least one time-slot of a first user's computer system maintained calendar comprising:

designating by said computer system to a second user-identification an a time slot based calendar access privilege to said calendar, wherein the time slot based calendar access privilege includes at least one of a time slot based calendar read access privilege and a time slot based calendar write access privilege, each said with the time slot based calendar read access privilege specifying including an ability to read data only from at least one specified a first subset of time-slots, and each said said the time slot based calendar write access privilege including an ability to write data only into at least one specified a second subset of time-slots, and wherein at least one of said first and second subsets having less than all available time slots;

14 reading by said computer system of a user's user identification that
15 ~~includes at least one of identifying the user to be said second user~~
16 ~~identification and an identification defined to have said access privilege~~
17 ~~designated to said second user; and~~
18 granting permission by the computer system to said second user to
19 accessing data of said first user's calendar by said user in accordance with
20 said time slot based calendar access privilege designated for said second
21 user.

1 9. The method defined in claim 8 wherein said second user has a user
2 identification includes an identification of one of a group type and identifiable
3 to one of a group affiliation and a user type.

1 10. The method defined in claim 8 including reading into said computer
2 system said second user's user identification and said time slot based
3 calendar access privilege, as an input to said designating.

1 11. The method defined in claim 8 wherein said designating includes
2 accessing from further including the computer system facilitating said first
3 user in providing said second user's user identification and said time slot
4 based calendar access privileges.

1 12. The method defined in claim 8 wherein said accessing includes further
2 including the computer system facilitating the user in inputting data into
3 selected ones of said second subset of time slots in accordance with said

4 | time slot based write access privilege, and reading data from selected ones of
5 | said first subset of time-slots in accordance with said time slot based read
6 | access privilege.

1 | 13. The method defined in claim 8 wherein said calendar includes at least
2 | one an event that spans a plurality of third subset of time-slots, where only
3 | some of said third subset of time-slots overlaps with said being first subset of
4 | time-slots, and said events having both time-slot data and descriptive data;
5 | wherein said computer system omits said descriptive data when said event is
6 | accessed by said second user accessing for each said event omits said
7 | descriptive data.

1 | 14. The method defined in claim 8 ~~wherein~~ said further including writing
2 | data to selected ones of said second subset of time-slots, entries including
3 | at least one of editing ~~said~~ data in for one or more of said second subset of
4 | time-slots entries, creating an event record in for one or more of said second
5 | subset of time-slots entries, inserting data into one or more of said second
6 | subset of time-slots entries, deleting data in one or more of said second
7 | subset of time-slots entries, and deleting an event record in one or more of
8 | said second subset of time-slots entries.

1 | 15. The method defined in claim 8 wherein each of said first and second
2 | subsets of time-slots includes at least one of a time-period on at least one
3 | specific date, and a time-period on each day of each week.

1 16. The method defined in claim 8 wherein said ~~further including~~ writing
2 data ~~further to selected ones of said second subset of time-slots, including~~
3 at least one of categorizing a meeting, categorizing an appointment,
4 categorizing a reminder, categorizing an event, categorizing an anniversary,
5 categorizing a family event, categorizing a school meeting, and categorizing a
6 social event.

1
1 17. The method defined in claim 8 wherein said time slot based calendar
2 access privilege further includes an event type time slot based calendar
3 access privilege including at least one of an event type and time slot based
4 calendar read access privilege that includes an ability to read data only from
5 said first subset of time slots for a specified event type, and an event type and
6 time slot based calendar write access privilege that includes an ability to write
7 data only into said second subset of time slots for a specified event type.

1 18. An article of manufacture including one or more computer-readable
2 media having stored thereon a plurality of programming instructions for
3 implementing a computer-hosted calendar to be executed by at least one
4 processor, that when executed perform the following operations:
5 designate to a user of said calendar a specific access ability based on
6 a characteristic of said user;
7 process a request to access said calendar based on said characteristic
8 based designated access ability.

1 19. The article of manufacture defined in claim 18, wherein said specific
2 access ability includes an ability to perform at least one of read data from only
3 specific read-data time-periods of said calendar, and write data into only
4 specific write-data time-periods of said calendar; and wherein said process
5 includes at least one of ~~retrieve~~send data ~~for~~to said user in conformance with
6 said read-data time-period specification, and update said calendar in
7 conformance with said write-data time-period specification.

1 20. The article of manufacture defined in claim 18 wherein said operations
2 further include before said designate,
3 associate with each of at least one user characteristics an access
4 ability to said calendar, said with each associated~~user~~ access ability including
5 an ability to at least perform one of only read data from specific read-data
6 time-periods of said calendar, and only write data into specific write-data time-
7 periods of said calendar; and wherein said designated specific access ability
8 includes ~~the~~said associated access ability ~~to said calendar if corresponding to~~
9 said characteristic of said user ~~conforms with one of said user characteristics~~.

1 21. The article of manufacture defined in claim 18 wherein said operations
2 include read from an administrative user of said calendar said characteristic
3 and the specific access ability to be designated before said designating.

1 22. The article of manufacturing defined in claim 18 wherein said
2 operations include read from an owner of said calendar ~~an identification of~~

3 | ~~said characteristic of said user and said specific access ability to be~~
4 | ~~designated, for each of at least one characteristic.~~

1 | 23. The article of manufacturing defined in claim 18 wherein said
2 | characteristic includes one of an individual identifier, a group affiliation, and a
3 | user type.

1 | 24. The article of manufacturing defined in claim 18 wherein said specific
2 | access ability includes an ability to read data from specific read-data time-
3 | periods of said calendar, and wherein if said calendar includes at least one
4 | event that spans a plurality of time-periods, with only some of which are read-
5 | data time periods, and wherein each of said at least one event includes both
6 | time-period data and descriptive data, then said process includes an ability to
7 | reading data from said specific read-data time periods and omitting said
8 | descriptive data.

1 | 25. The article of manufacturing defined in claim 18 wherein said
2 | operations include read from an owner of said calendar, before said
3 | designate, a first characteristic and an associated first specific access ability,
4 | and at least one second characteristic that is assigned the specific-said-first
5 | characteristic access ability associated with said first characteristic before
6 | said designating, and wherein if when said user characteristic is equivalent to
7 | one of said at least one second characteristics, said designating user is
8 | designated said first access ability as its specific access ability.

1 26. The article of manufacturing defined in claim 18 wherein said process
2 includes, if said designated specific access ability includes an ability to write
3 into said calendar for specific write-data time-periods, process a request to
4 write data into said calendar for said write-data time -periods, and if said
5 designated specific access ability includes an ability to read data from said
6 calendar for specific read-data time-periods, process a request to read data
7 from said calendar for said read-data time-periods.

1 27. The article of manufacturing defined in claim 18 wherein said specific
2 access ability includes an ability to perform at least one of read data from only
3 specific event type time-periods of said calendar, and write data into only
4 specific event type read-data time periods of said calendar; and wherein said
5 process includes at least one of ~~send-retrieve~~ data ~~for~~to said user in
6 conformance with said read-data time-period specification, and update said
7 calendar in conformance with said write-data time period specification.

1 28. The article of manufacturing defined in claim 18 wherein said process
2 further includes an ability to ~~said user updating~~ said calendar ~~by a user with~~
3 specified event type data.

ABSTRACT OF THE DISCLOSURE

A method of calendaring events in a computing system, and an article containing instructions for operating a calendar in a computing system are disclosed. A calendar owner defines a plurality of user types and user identifications for his or her calendar. Each user type or identification has a separate associated read and/or write access to the calendar owner's calendar defined by the specific calendar time slots accessible in the calendar owner's calendar. These read and/or write time slots are determined by the calendar owner so that different second party users can each have separately defined read and/or write access capability to the calendar owner's calendar determined by the calendar owner.

A second user either explicitly or by virtue of its group affiliation or user type is given access to read and/or write accesses to selected time slots of a first user's calendar.